MP MASTER
MA28831

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INSTRUCTION MANUAL

REGULATED POWER SUPPLIES

LOS R SERIES

SPECIFICATIONS AND FEATURES

DC OUTPUT — Voltage regulated for line and load. For voltage and current ratings see table I below.

TABLE I

MODEL	VOLTAGE RANGE	MAXIMUM CURRENT (AMPS) AT AMBIENT TEMPERATURE		
		40°C	50°C	60°C
LOS-R-2	2 ± 5%	25.0	21.5	17.5
LOS-R-5	5 ± 5%	25.0	21.5	17.5
LOS-R-6	6 ± 5%	23.0	20.0	16.5
LOS-R-12	12 ± 5%	16.0	13.5	10.5
LOS-R-15	15 ± 5%	14.0	11.5	8.8
LOS-R-20	20 ± 5%	11.5	9.5	7.1
LOS-R-24	24 ± 5%	10.5	8.3	6.0
LOS-R-28	28 ± 5%	9.3	7.5	5.6

Current range must be chosen to suit the appropriate maximum ambient temperature. Current ratings apply for entire voltage range.

REGULATED VOLTAGE OUTPUT

Regulation (line) ..... 0.15% for input variations from 105-125, 125-105, 210-250, or 250-210 volts AC.

Regulation (load) ..... 0.15% for load variations from no load to full load or full load to no load.

Ripple and Noise ..... 1.5mV rms, 5mV peak to peak with either positive or negative terminal grounded.

Temperature Coefficient ..... 0.03%/°C

Remote Programming
External Resistor
LOS-R-2 ..... Nominal 1000 ohms/volt output. The programming coefficient is negative. Increasing resistance decreases output voltage. Use a low temperature coefficient resistor to assure most stable operation.

LOS-R-5 through LOS-R-28 ..... Nominal 200 ohms/volt output. Increasing resistance increases output voltage. Use a low temperature coefficient resistor to assure most stable operation.

Programming Voltage ..... One-to-one voltage change. The programming supply must have a reverse current capability of 6 ma min. Programming supply need not have reverse current capability when programming LOS-R-2.

Remote Sensing ..... Provision is made for remote sensing to eliminate the effect of power output lead resistance on DC regulation. Sensing leads should be a twisted pair to minimize AC pickup. A 2.5 mf elect. capacitor may be required between output terminals and sense terminals to reduce noise pickup.

OVERSHOOT — No overshoot under conditions of power turn-on, turn-off, or power failure

AC INPUT — 105-125 or 210-250 volts AC at 47-440 Hz. Standard LOS-R power supplies are factory wired for 105-125 volt input, but are available factory wired for 210-250 volt input on request. See figure 1 and schematic diagram for rewiring of AC input. Input power: 440 Watts* for models LOS-R-2 through LOS-R-15; 500 Watts* for models LOS-R-20 through LOS-R 28. Ratings apply for 57-63 Hz input. For 47-53 Hz input derate current 10% for each ambient temperature given in table I. For 63-440 Hz input consult factory.
*With output loaded to full current rating and input voltage 125 volts AC, 60 Hz.

OVERLOAD PROTECTION — Automatic electronic current limiting circuit, limits output current to a safe value, protecting load and power supply when external overloads and direct shorts occur.

INPUT AND OUTPUT CONNECTIONS — See outline drawing for location.

AC input	Terminals on transformer
Ground	Terminal on transformer
DC output	8-32 studs on printed circuit board
Sensing	Turret terminal on printed circuit board

OPERATING AMBIENT TEMPERATURE RANGE AND DUTY CYCLE — Continuous duty from 0°C to +60°C ambient with corresponding load current ratings for all modes of operation.

STORAGE TEMPERATURE — -20°C to +85°C

DC OUTPUT CONTROL — Screwdriver voltage adjust control permits adjustment of DC output voltage. See outline drawing for location of control.

GUARANTEE — 60 day guarantee from date of shipment . . . . . materials and labor.

PHYSICAL DATA

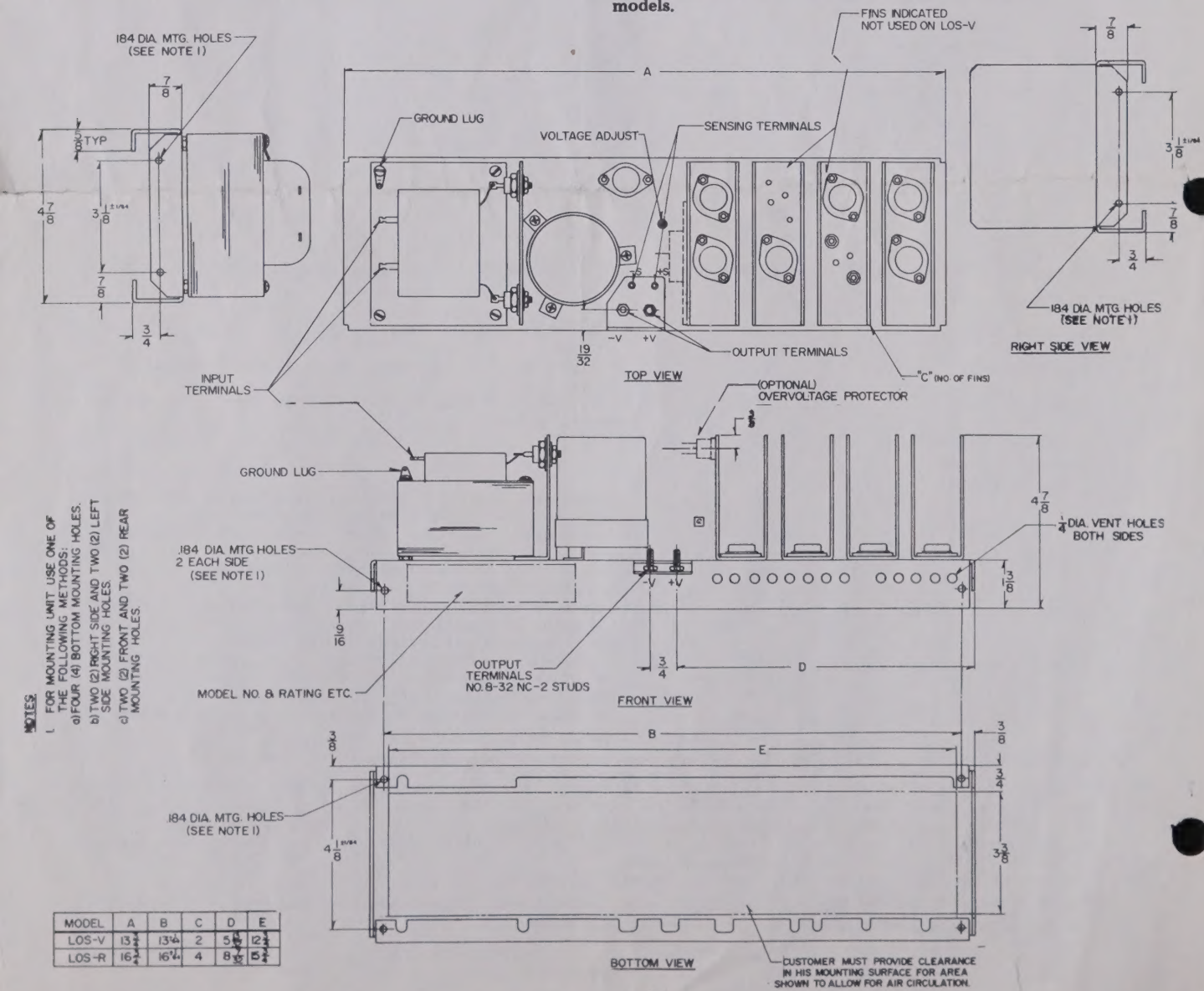
Size	4-7/8" x 16-3/4" x 4-7/8"
Weight	14-3/4 lbs. net; 16-1/4 lbs. shipping
Finish	Gray. FED. STD. 595 No. 26081

MOUNTING — Three surfaces, each with clearance mounting holes, can be utilized for mounting this unit. All LOS-R power supplies can be mounted with top, front or rear facing up. Top, front, or rear must be in a horizontal plane. Air circulation is required when unit is mounted in confined areas. Refer to Outline Drawing for mounting details.

"J" OPTION — Standard LOS power supplies can be obtained for 90-110 VAC, 47-440 Hz input. For 47-53 Hz input derate current 10% for each ambient temperature given in table I. For 63-440 Hz input consult factory.

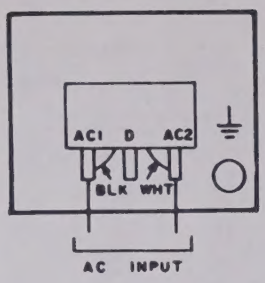
ACCESSORIES

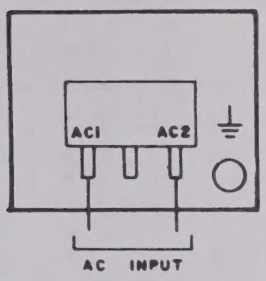
Overvoltage Protector . . . . . Externally mounted L-20-0V series and L-35-0V series Overvoltage Protectors are available for use with all models.



NOTES:
1. FOR MOUNTING UNIT USE ONE OF THE FOLLOWING METHODS:
   a) FOUR (4) BOTTOM MOUNTING HOLES.
   b) TWO (2) RIGHT SIDE AND TWO (2) LEFT SIDE MOUNTING HOLES.
   c) TWO (2) FRONT AND TWO (2) REAR MOUNTING HOLES.

MODEL	A	B	C	D	E
LOS-V	13 1/4	13 3/4	2	5 5/16	12 3/4
LOS-R	16 3/4	16 3/4	4	8 5/16	5 3/4

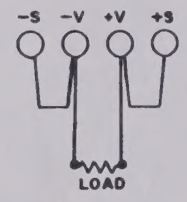




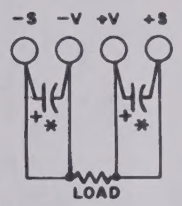
* AC INPUT CONNECTION SHOWN IS FOR 105-125VAC
FOR 210-250V INPUT, DISCONNECT BLK & WHT TRANFORMER
LEADS FROM TERMS AC1 & AC2 AND RECONNECT BOTH LEADS
TO TERM D

Figure 1. AC Input Connection.

Figure 2. AC Input Connection, "J" Option.



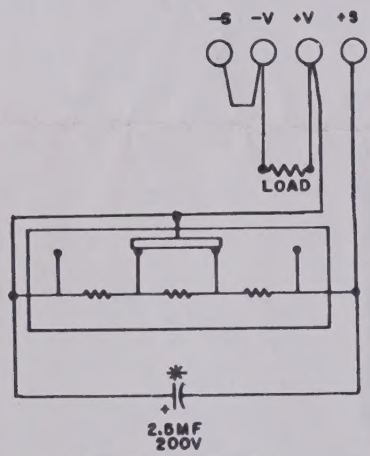
(A) LOCAL SENSING



(B) REMOTE SENSING

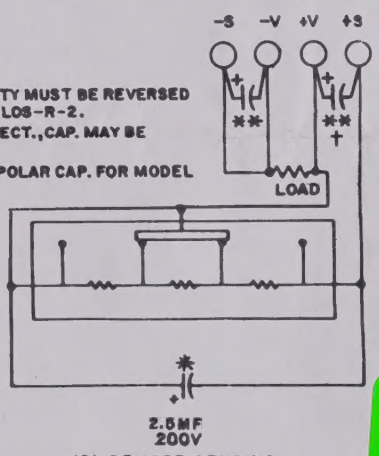
* A 2.5MF, ELECT., CAP. MAY BE REQUIRED.

Figure 3. DC Output Connection.



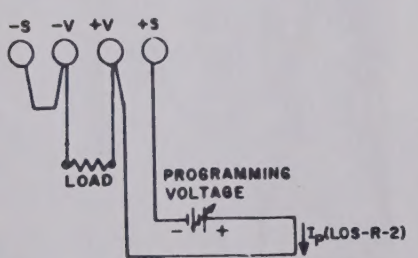
(A) LOCAL SENSING

*CAP. POLARITY MUST BE REVERSED FOR MODEL LOS-R-2.
**A 2.5MF, ELECT., CAP. MAY BE REQUIRED.
+ USE A NON-POLAR CAP. FOR MODEL LOS-R-2.

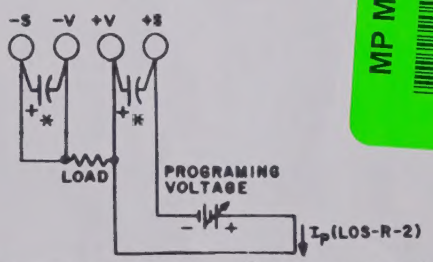


(B) REMOTE SENSING

Figure 4. Programmed Voltage, With External Resistor



(A) LOCAL SENSING —→ Ip (EXCEPT LOS-R-2)



(B) REMOTE SENSING —→ Ip (EXCEPT LOS-R-2)

* A 2.5MF, ELECT., CAP. MAY BE REQUIRED.

Figure 5. Programmed Voltage, With External Programming Voltage Source.

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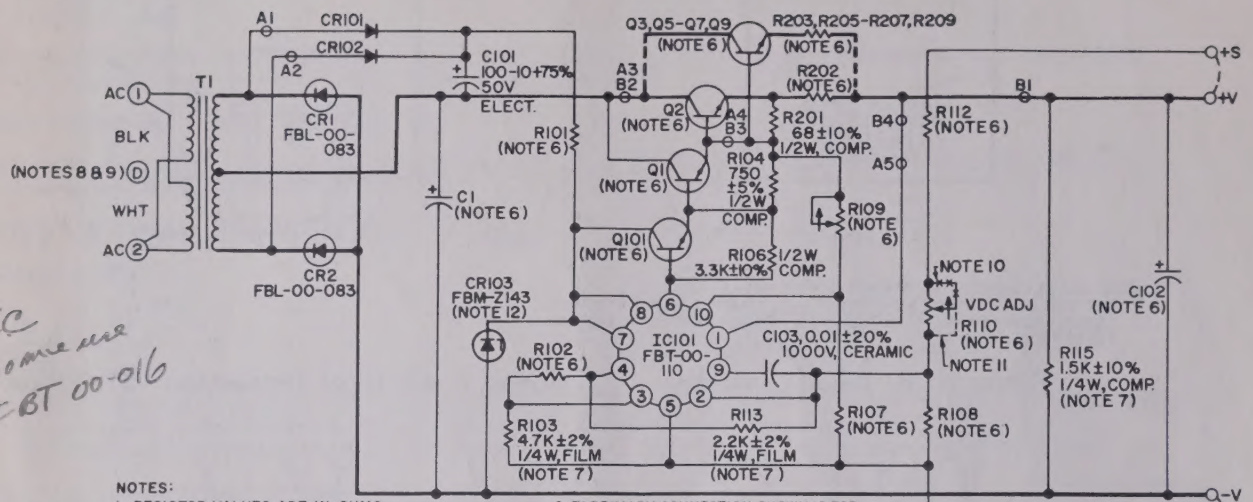

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NOTES:
1. RESISTOR VALUES ARE IN OHMS.
2. CAPACITOR VALUES ARE IN MICROFARADS.
3. DESIGNATIONS ARE LAMBDA PART NUMBERS.
4. SYMBOLS:
   - INDICATES CLOCKWISE ROTATION OF SHAFT.
   - INDICATES CONNECTION TO CHASSIS.
   - LAMBDA PART NO. FBL-00-030; USE IN4002 DIODE FOR REPLACEMENT UNLESS OTHERWISE NOTED.
   - INDICATES TERMINAL ON PRINTED CIRCUIT BOARD.
   - INDICATES ACTUAL UNIT MARKING.
5. FOR OPERATION AT 47-53 Hz, DERATE CURRENT BY 10%. FOR OPERATION AT 63-440 Hz, CONSULT FACTORY.
6. SEE TABLE II FOR COMPONENT VALUES.
7. R113 & R115 ONLY USED ON MODEL LOS-R-2.
8. T1 PRIMARY CONNECTION SHOWN IS FOR 105-125 VAC INPUT. FOR 210-250 VAC INPUT: DISCONNECT BLK & WHT TRANSFORMER LEADS FROM TERMS AC1 & AC2 AND RECONNECT BOTH LEADS TO TERM D.
9. "J" OPTION UNITS HAVE SINGLE T1 PRIMARY. AC INPUT IS 90-110 VAC.
10. NOT USED ON MODEL LOS-R-2.
11. ONLY USED ON MODEL LOS-R-2.
12. CR103 NOT USED ON MODELS LOS-R-2 THRU LOS-R-6.

FOR WIRING OF POWER SUPPLY TO LOAD REFER TO SUPPLY-TO-LOAD WIRING DIAGRAMS
DOTTED CONNECTIONS SHOWN INDICATE JUMPERS IN PLACE FOR LOCAL SENSING CONNECTION.

SCHEMATIC DIAGRAM
REGULATED POWER SUPPLY
MODELS
LOS-R SERIES

LAMBDA
ELECTRONICS
MELVILLE, NEW YORK
DIVISION OF Veeco INSTRUMENTS INC.

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TABLE II
SCHEMATIC DATA REFERENCES
MODELS LOS-R-2 THRU LOS-R-28

Models	Schematic Components												
	C1	C102	Q1-Q3 Q5-Q7** Q9	Q101	R101	R102	R103	R107	R108	R109	R110	R112	R202, R203 R205-R207** R209
	-10+100% ELECT	-10+75% ELECT	*FBN-	*FBN-		FILM	1/4W FILM	1/2W COMP	1/4W FILM	±10% 1/2W WW	±10% 1-1/2W WW	±1% 1/4W FILM	±5% 3W WW
LOS-R-2	41,000 mf 15 vdc	2000 mf 16 vdc	L198	L113	47 ±5% 1/2W COMP	4.7K ±2% 1/2W	2.2K ±2%	1.2K ±10%	2.2K ±2%	600	600	Jumper	0.10
LOS-R-5	41,000 mf 15 vdc	2000 mf 16 vdc	L198	L113	100 ±5% 1/2W COMP	2.49K ±1% 1/4W	3.83K ±1%	2.7K ±10%	825 ±1%	1.2K	600	Jumper	0.10
LOS-R-6	41,000 mf 15 vdc	2000 mf 16 vdc	L198	L113	100 ±5% 1/2W COMP	2.49K ±1% 1/4W	3.83K ±1%	2.7K ±10%	825 ±1%	1.2K	600	Jumper	0.10
LOS-R-12	23,000 mf 50 vdc	1200 mf 25 vdc	L198	L109	1K ±10% 1W COMP	619 ±1% 1/4W	Not Used	6.2K ±5%	1.47K ±1%	1.2K	1.0K	562	0.15
LOS-R-15	23,000 mf 50 vdc	1200 mf 25 vdc	L198	L109	1.5K ±10% 2W COMP	619 ±1% 1/4W	Not Used	7.5K ±5%	1.47K ±1%	1.2K	1.2K	1.21K	0.15
LOS-R-20	23,000 mf 50 vdc	722 mf 50 vdc	L156	L109	3K ±3% 3W WW	1K ±1% 1/2W	Not Used	10K ±5%	1.47K ±1%	1.2K	1.2K	2.15K	0.30
LOS-R-24	23,000 mf 50 vdc	722 mf 50 vdc	L156	L109	3.3K ±10% 2W COMP	1K ±1% 1/2W	Not Used	12K ±5%	1.47K ±1%	1.2K	1.8K	2.55K	0.30
LOS-R-28	23,000 mf 50 vdc	722 mf 50 vdc	L156	L109	4.7K ±10% 2W COMP	1K ±1% 1/2W	Not Used	13K ±5%	1.47K ±1%	1.2K	1.8K	3.48K	0.30

*Lambda part no.
**Q7 and R207 not used on models LOS-R-12 thru LOS-R-28